The use of kume grass (*Sorghum Plumosum var. Timorense*) to substitute king grass (*Pennisetum purpurephoides*) fed on Bali cattle in East Nusa Tenggara

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ABSTRACT : A research has been conducted for three months to study the use of kume standing hay *(Sorghum plumosum var. Timorense*) hydrolyzed with natural alkali as Bali cattle feed. Twenty heads of Bali cattle of 1.0-1.5 years old (live body-weight of 119.20-158.40 kg). Experimental design used was completely randomized design consisted of five treatments and four replications. The treatments were : T_0 = 80% king grass + 20% concentrate; T_1 = 70% king grass + 20% concentrate + 10% hydrolyzed kume standing hay; T_2 = 60% of king grass + 20% of concentrate + 20% hydrolyzed kume standing hay; T_3 = 50% of king grass + 20% of concentrate + 30% hydrolyzed Kume standing hay; T_4 = 40% of king grass + 20% of concentrate + 40% hydrolyzed kume standing hay. These treatments added with feed additive of 100g bioport and 100g bioplus probiotic. Analysis of variance was used to analyze data and Duncan's multiple range test was used for further test. Variables measured were dry matter, organic matter, crude protein, crude fat, and crude fiber intake, and daily live weight gain. The results showed that content of dry matter, organic matter, crude fiber ($P<0.05$) decreased, while crude protein, crude fat, nitrogen free extract, and ADF were significant ($P<0.05$) increased. It can be concluded that kume standing hay hydrolyzed with natural alkali has a possibility to substitute king grass up to 30% in the ration of Bali cattle; and additives of bioplus and bioport probiotic each at level of 100 g was able to increase the intake of dry matter, organic matter, crude protein and crude fiber and growth of Bali cattle.

Key words : kume grass, natural alkali hydrolysis, probiotic, bali cattle

INTRODUCTION

Bali cattle are kept as a common domestic animal in the rural areas of West Timor, East Nusa Tenggara and grass is the main feedstuff. Annual native grass like kume grass (*Sorghum plumosum var. Timorense)* are abundant during a short period of rainy season in this region, particularly in Kupang and its surrounding with an average of production exceeding 17 tonnes of fresh matter. Attempts have been made to utilize it as feed to both Bali cattle and local goat. However, kume grass contains high proportion of lignin (i.e. 7.51%) and its digestibility is very low. As a result, small amount of kume grass is being used for feed for ruminant animals (Dami Dato, 1998). Urea is commonly used to enhanced digestibility of fibrous by product through ammoniation process. Ammoniation of crop residues and agro-industrial by product with urea can supply nitrogen to rumen microbe (Zain *et al*., 2006). However, there is no data available on the use of kume grass as feed for Bali cattle. Therefore, it is necessary to study the use of kume standing hay *(Sorghum plumosum var. Timorense)* hydrolyzed with natural alkali and added with probiotic additive as feed on Bali cattle.

MATERIALS AND METHODS

The experiment was conducted for three months at the experimental site owned by Kupang State Agricultural Polytechnic. Twenty heads male Bali cattle of 1.0 – 1.5 years old with an initial body weight ranging from 119.2 to 158.4 kg (136.6 ± 11.17kg) were employed in this experiment. Ration used was composed of 1) king grass (*Pennisetum purpureum*) as basal diet, 2) "kume" standing hay

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hydrolyzed with filtrate of rice hull ash (KSHH) added with probiotics (bioplus and bioport), and 3) concentrate namely rice-bran, corn meal, "putak" meal, and *Gliricidia sepium* leaves meal. Ratio of these ingredients were 80:20:0, 70:20:10, 60:20:20, 50;20:30, and 40:20:40 for T_0, T_1, T_2, T_3, and T_4, respectively. They were formulated to meet National Research Council (NRC, 1984) requirements for beef cattle. Nutrient content of dietary treatments were presented in Table 1. Feed intake was recorded daily, while bodyweight was weighed biweekly. SAS programme package was employed to analyze data (SAS Institute, 1989).

Table 1. Nutrient analysis of dietary treatments (% DM basis).

Nutrient	T_0	T_1	T_2	T_3	T_4
Dry matter	34,50	39,84	45,18	50,52	55,86
Organic matter	30,76	35,93	41,10	46,26	51,43
Crude protein	9,64	9,49	9,33	9,18	9,02
Crude fat	5,00	4,78	4,57	4,36	4,14
Crude fiber	27,56	27,18	26,81	26,43	26,06
Nitogen Free Extract	54,06	54,64	55,21	55,78	56,35
Total Digestible Nutrient	64,63	64,64	64,56	64,40	64,10

RESULTS AND DISCUSSION

The statistical analysis of the experiment are presented in Table 2. The treatment significantly ($P < 0.05$) affected the all variables measured. Nutrients intake of KSSH treatments were better than control. Further test, in general, the results indicated that KSHH treatments were significantly differ ($P<0.05$) from control except dry matter, where T_3 was the highest and no significantly different between T_1 and T_0.

Table 2. Mean of nutrients intake (g d^{-1}) and bodyweight gain (kg d^{-1}) of Bali cattle fed on kum standing hay hydrolyzed with natural alkali and added with probiotics

Nutrients	Treatment				
	T_0	T_1	T_2	T_3	T_4
Dry matter	4,504.45 [a]	4,508.21 [a]	4,512.85 [b]	4,530.94 [d]	4,525.94 [c]
Organic matter	1,385.57 [a]	1,619.80 [b]	1,854.78 [c]	2,096.01 [d]	2,327.69 [e]
Crude protein	408.24 [a]	415.94 [b]	421.05 [c]	427.83 [d]	434.23 [e]
Crude fat	187.37 [a]	197.55 [b]	206.24 [c]	215.49 [d]	225.22 [e]
Body weight gain (kg)	0,38 [a]	0,42 [b]	0,52 [c]	0,70 [d]	0,68 [d]

[a,b,c,d,e]Means within a row with unlike superscripts differ ($P < 0.05$)

Meanwhile for the other variables measured, the KSHH were differ from control, among the KSHH themselves was differ each other, and T_4 was the highest. The increased of KSHH quality was probably due to the addition of probiotics. This agreed to Kana Hau (2004) who reported that the use of native grass, *Sesbania grandiflora*, "putak" and probiotic on Bali cattle was performed better. This result indicated that the use of KSHH in substituting king grass performing better than control and also able to increase palatability and feed intake. This means that quality of KSHH is the same as king grass, especially to meet energy requirement of cattle. This is in accordance with Parakkasi and Hutasoit (1978) who work with cattle and found that the cattle consumed till their energy requirement is met. This study also confirmed that additives of bioplus and bioport probiotic each at level of 100 g was able to increase the intake of dry matter, organic matter, crude protein and crude fiber and growth of Bali cattle. These results is in agreement with the previous reports of Huber (1997) and Lopez (2000).

CONCLUSIONS

From the results obtained during the three months of feeding trial, it can be concluded that kume standing hay hydrolyzed with natural alkali has a possibility to substitute king grass up to 30% in the

ration of Bali cattle; and additives of bioplus and bioport probiotic each at level of 100 g was able to increase the intake of dry matter, organic matter, crude protein and crude fiber and growth of Bali cattle.

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